

THE EFFECTIVENESS OF COOPERATIVE LEARNING MODEL TYPE OF THINK PAIR SHARE (TPS) TOWARD MATHEMATICS LEARNING INTERACTION IN CLASS VII

Yashinta Priscilia Dano^a, Sunaryo^b

Program Studi Pendidikan Matematika Universitas Ahmad Dahlan
Jalan Ring Road Selatan, Tamanan, Banguntapan, Bantul, Yogyakarta
^adanoyashinta@gmail.com, ^bsunaryo.bener@yahoo.co.id

ABSTRACT

Based on the result of interviews and observations, I found the problem that became the reason for this research. One of that is the learning model commonly used in Muhammadiyah Junior High School 1 Yogyakarta (SMP Muhammadiyah 1 Yogyakarta) has not been optimal to create mathematics learning interaction of students. This research aims to determine (1) the presence or absence of difference in mathematics learning interaction between a student is taught using cooperative learning model Think Pair Share (TPS) type with students taught using direct learning model and (2) which learning model is more effective between cooperative learning model Think Pair Share (TPS) type with direct learning model toward mathematics learning interaction of students. The type of this research is quantitative research, using experimental design. The population in this research was the students of regular class VII in SMP Muhammadiyah 1 Yogyakarta, even semester academic year 2016/2017. Research sampling done by random sampling toward class, selected VII F class as the experimental class, and VII G class as the control class. Technique data collection using the observation method. The prerequisite analysis test used a normality test using the Chi-square formula and homogeneity test using the Bartlett test. Data analysis used a hypothesis test using a t-test with a significant 5% level and degrees of freedom 61. Based on the results of the hypothesis, I test obtained $t_{\text{count}} = -0,7925$ and $t_{\text{table}} = 1,9996$. Because $t_{\text{count}} < t_{\text{table}}$, so H_0 is accepted. So, concluded that there is no difference in mathematics learning interaction between students taught using cooperative learning model Think Pair Share (TPS) type with students taught using a direct learning model. Because of the hypothesis, I obtained no difference, and then the hypothesis II test is not needed to continue. So, concluded that the cooperative learning model Think Pair Share (TPS) type is not more effective than the direct learning model.

Keywords: Cooperative Learning Model Think Pair Share (TPS) Type, Direct Learning Model, Learning Mathematics Interaction of Students

INTRODUCTION

Education is important in human life to improve the quality of Human Resources (HR). Education to create an atmosphere of learning and learning process so that students actively develop their potential. Education is done through learning in schools. One of the subjects taught at school is mathematics. According to Mulyasa, E. (2005: 101), the learning process is effective if all students are actively involved, both mentally, physically, and socially. The statement means that students do an activity in the learning process.

In line with this statement, Sardiman (2016: 15-17) details the characteristics of learning interactions in which student activities mark one of them. As a consequence, that students are central, student activity is an absolute requirement for ongoing learning interactions. Student activities in this regard, both physically and mentally active. So there is no point in teachers doing learning interaction activities if students are only passive. Learning can be interpreted as a process of student interaction with teachers and learning resources in a learning environment. According to Fathurrohman, Muhammad & Sulistyorini (2012: 24): Interaction is a mutual influence or mutual influence with each

other, which minimally occurs between two parties. Student learning interactions are simply listed in the Directorate of High School Development (2010: 58).

1. Student interaction with the teacher
 - a) Students ask the teacher
 - b) Students answer teacher questions
 - c) Students use the teacher as a resource
 - d) Students use the teacher as a facilitator
2. Interaction between students
 - a) Students ask friends in a group
 - b) Students answer questions of friends in a group
 - c) Students ask friends in other groups
 - d) Students answer questions of friends in other groups
3. Student interaction with learning resources
 - a) Students prepare to learn resources
 - b) Students read learning resources
 - c) Students complete assignments from learning resources
 - d) Students use other learning resource references

To find out how students' learning interactions are at school, on 18 October 2016 and 16 November 2016, interviews and observations were conducted at Muhammadiyah 1 Yogyakarta Middle School. Based on the results of interviews with teachers who obtained information that the teacher in delivering learning material using direct learning models, students are not accustomed to learning in groups. Most of the students still talk to their classmates outside the learning topic. Based on observations obtained that most students do not ask the teacher when students are allowed to ask questions by the teacher, most students do not answer the questions given by the teacher, most students do not ask each other questions when experiencing difficulties in completing the tasks given by the teacher, students talk about other things outside the topic of learning, and students only prepare and read learning resources after being instructed repeatedly by the teacher. Based on the acquisition of midterm of VII grade mathematics students, there are still many who have not yet completed or do not meet the Minimal Completeness Criteria (MCC) is 76.

Based on the description above, the problem is formulated as follows.

1. Is there a difference in the interaction of mathematics learning of students who are taught using the Cooperative Learning Model Think Pair Share (TPS) type with students who are taught using direct learning models in class VII students of SMP Muhammadiyah 1 Yogyakarta Semester II 2016/2017 Academic Year?
2. Is the Think Pair Share (TPS) type of cooperative learning model more effective than the direct learning model of mathematics learning interactions for grade VII students of SMP Muhammadiyah 1 Yogyakarta Semester II 2016/2017 Academic Year?

One effort to create optimal mathematical learning interactions is to use a variety of learning models. One of them is using a cooperative learning model type Think Pair Share (TPS). Think Pair Share (TPS) type of cooperative learning model is a learning model that places students in groups in pairs by giving students time to think and respond and help one another. The learning process stages that use the Think Pair Share (TPS) type of cooperative learning model are implemented as follows.

Table 1. Stages of Think Pair Share Cooperative Learning Model

Stage	Teacher Behavior	Students Behavior
Step 1 Thinking Think individually	The teacher asks questions or issues related to the subject matter individually	Students think and answer questions given by the teacher individually
Step 2 Pairing Pair up with friends and discuss answers together	The teacher assigns students to pair up with their classmates and discuss the problems given by the teacher in Stage 1	Students pair up with a classmate, then discuss the answers to questions given by the teacher within a certain time
Step 3 Sharing Share or present answers with pairs throughout the class	The teacher assigns students to share the results of each pair's discussion in front of the class	Students individually or both present the results of the discussion in front of the class, the other pairs respond to the results presented

METHODS

This type of research is quantitative research using experimental designs. This research was conducted at SMP Muhammadiyah 1 Yogyakarta. Data collection was conducted in the second semester of the 2016/2017 school year with the subject matter. In this study, the population used is the regular class, namely class VII E, class VII F, and class VII G. Sampling using random sampling techniques to the class, the sample obtained by lottery against the class. From the random sampling results obtained VII F as an experimental class that is class learning using the Cooperative learning model Think Pair Share (TPS) and class VII G as a control class that is class learning using the direct learning model.

The technique used to collect data in this study is the observation method. The research data collection instrument used observation sheets. This observation sheet aims to determine the interaction of students' mathematics learning using Think Pair Share (TPS) cooperative learning models and direct learning models. Research indicators are needed as a tool or guide to measuring student learning interactions in this study. The research indicators used in this study are presented in Table 2 as follows.

Table 2. Research Indicators

No	Indicator	Observation Description
1	Interaction between students and teachers	a. Students ask the teacher b. Students answer teacher questions c. Students use the teacher as a resource d. Students use the teacher as a facilitator
2	Interaction between students	a. Students ask their partners b. Students answer their partner's questions c. Students ask other couples d. Students answer other pairs' questions
3	Interaction between students and learning resources	a. Students prepare to learn resources b. Students read learning resources c. Students complete assignments from learning resources d. Students use other learning resource references.

Before an instrument is given, its validity needs to be tested first. A valid instrument means a measuring tool used to obtain valid data. This study uses construct validity to test instruments. For construct validity, judgment from experts (judgment experts) can be used. Data analysis is directed to answer the problem formulation or test the hypotheses that have been formulated in the proposal then conclude. Before testing hypotheses, prerequisite testing needs to be done. Two prerequisites must be met, namely the normality test and the homogeneity test.

A normality test is carried out to determine whether the samples taken are distributed normally or not using the t-test. The assessment criteria of the distribution normality test are that the data will be normally distributed if the value of $\chi^2_{count} \leq \chi^2_{table}$ is obtained.

Table 3. Test Results of Mathematics Learning Interaction Normality

Description	Experimentation Class	Control class
χ^2_{count}	3,7084	3,7873
χ^2_{table}	7,8147	9,4877
Testing Criteria	A normal distribution sample if $\chi^2_{count} \leq \chi^2_{table}$	
Info	Normal	Normal

A homogenization test is performed to determine whether the research sample starts with a homogeneous condition. To test the similarities, two variances used the Bartlett test. The evaluation criteria of a homogeneity test are that the data will be homogeneous when acquired value $\chi^2_{count} \leq \chi^2_{table}$

Table 4. Test result homogeneity of mathematics learning interactions

Description	Results
χ^2_{count}	1,2220
χ^2_{table}	3,8415
Testing Criteria	A homogeneous sample if $\chi^2_{count} \leq \chi^2_{table}$
Inf	homogeneous

According to Sudjana (2005:219), A hypothesis is an assumption or suspicion of something made to explain what is often required to do the treatment. Steps or procedures to determine whether accepting or rejecting hypotheses is called a hypothesis test.

To prove the hypothesis that there is or whether there is a difference in mathematical learning interactions students are taught using a Think Pair Share (TPS) cooperative learning model with To prove the hypothesis that there are or no differences in student mathematics learning interactions taught using a Think Pair Share (TPS) cooperative learning model with students taught using live learning models, I conducted a hypothesis test that was an average test of two parties. The hypothesis is used as follows.

$$H_0: \mu_1 = \mu_2$$

$$H_1: \mu_1 \neq \mu_2$$

With:

H_0 : There are no differences in mathematics learning interactions of students taught using cooperative learning model Think Pair Share (TPS) with students who are taught using a direct learning model in grade VII students SMP Muhammadiyah 1 Yogyakarta semester II school year 2016/2017

H_1 : There are differences in mathematics learning interactions of students taught using cooperative learning model type Think Pair Share (TPS) with students who are taught using a direct learning model in grade VII students SMP Muhammadiyah 1 Yogyakarta semester II school year 2016/2017.

The test criteria used in the average test are two parties that use a significant level of 5% and the degree of freedom (df) = $n_1 + n_2 - 2$.

1. If $-t_{\frac{\alpha}{2}, n_1+n_2-2} \leq t_{count} \leq t_{\frac{\alpha}{2}, n_1+n_2-2}$, then H_0 accepted dan H_1 rejected.
2. If $-t_{\frac{\alpha}{2}, n_1+n_2-2} > t_{count}$ or $t_{count} > t_{\frac{\alpha}{2}, n_1+n_2-2}$, then H_0 rejected dan H_1 accepted.

Based on the hypothesis test results, I acquired $t_{count} = -0,7925$ and $t_{table} = 2,6589$. It appears that $t_{count} < t_{table}$, then H_0 accepted dan H_1 rejected. It shows that there are no differences in mathematics learning interactions of students taught using cooperative learning models of Think Pair Share (TPS) with students who are taught using a direct learning model in class VII SMP Muhammadiyah 1

Yogyakarta semester II school year 2016/2017 meaning both samples after being subject to different treatment results have no difference.

To prove the hypothesis that a model of learning is more effective between a model of cooperative learning Think Pair Share with a direct learning model, it is performed a II hypothesis test, which is the average test of one party. The hypothesis is used as follows.

$$H_0: \mu_1 \leq \mu_2$$

$$H_1: \mu_1 > \mu_2$$

With

H_0 : The Think Pair Share (TPS) type of cooperative learning model is not more effective than the direct learning model of mathematics learning interaction for Grade VII students of SMP Muhammadiyah 1 Yogyakarta in the second semester the 2016/2017 school year.

H_1 : The Think Pair Share (TPS) type of cooperative learning model is more effective than the direct learning model of the mathematics learning interaction of Grade VII students of SMP Muhammadiyah 1 Yogyakarta in the second semester of the 2016/2017 school year.

The testing criteria used in the average test of one party using a 5% significance level and degrees of freedom (df) = $n_1 + n_2 - 2$ are as follows.

1. If $t_{count} \leq t_{\alpha, n_1 + n_2 - 2}$, then H_0 accepted and H_1 rejected.
2. If $t_{count} > t_{\alpha, n_1 + n_2 - 2}$, then H_0 rejected and H_1 accepted.

Because in the first hypothesis test, it was obtained that there were no differences in students mathematics learning interactions, then the hypothesis II test did not need to proceed. This shows that the Think Pair Share (TPS) type of cooperative learning model is no more effective than the direct learning model of mathematics learning interaction for Grade VII students of SMP Muhammadiyah 1 Yogyakarta in the second semester of the 2016/2017 school year.

RESULTS and Discussion

This study aims to determine whether or not there are differences in the interaction of mathematics learning of students who are taught using cooperative learning models Think Pair Share (TPS) type with students who are taught using direct learning models in class VII students of SMP Muhammadiyah 1 Yogyakarta in the second semester of 2016/2017 school year and the effectiveness of the Think Pair Share (TPS) type of cooperative learning model compared to the direct learning model of the mathematics learning interactions of Grade VII students of SMP Muhammadiyah 1 Yogyakarta in the second semester of the 2016/2017 school year.

In the normality test regarding students' mathematical learning interactions with a significant level of 5% in the Think Pair Share (TPS) cooperative learning model, the value $\chi^2_{count} = 3,7084$ and the value $\chi^2_{table} = 7,8147$ so $\chi^2_{count} < \chi^2_{table}$ and in the Direct learning model obtained $\chi^2_{count} = 3,7873$ and $\chi^2_{table} = 9,4877$, so $\chi^2_{count} < \chi^2_{table}$. This shows that both sample classes are normally distributed. Furthermore, the homogeneity test of mathematics learning interaction is obtained $\chi^2_{count} = 1,2220$ and $\chi^2_{table} = 3,8415$ so that $\chi^2_{count} < \chi^2_{table}$. The conclusion is that the data is homogeneous.

Both prerequisite tests are fulfilled, then the hypothesis testing phase I is performed using a t-test with a significance level of 5%, obtained $t_{count} = -0,7925$ and $t_{table} = 2,6589$, so $t_{count} < t_{table}$. Based on the results of the hypothesis I test showed no differences in the interaction of mathematics learning of students who were taught using cooperative learning models Think Pair Share (TPS) type with students who were taught using Direct learning models in class VII students of SMP Muhammadiyah 1 Yogyakarta semester II of the 2016/2017 school year meaning the two samples after being subjected to different treatments the results have no difference. Because in the first hypothesis test, it was obtained that there were no differences in students' mathematics learning interactions, then the hypothesis II test did not need to proceed. This shows that the Think Pair Share (TPS) type of cooperative learning model is no more effective than the direct learning model of mathematics learning

interaction for Grade VII students of SMP Muhammadiyah 1 Yogyakarta in the second semester of the 2016/2017 school year.

By the theory of Think Pair Share (TPS) cooperative learning models that have been put forward in theoretical studies that the learning model can create optimal student mathematics learning interactions because the Think Pair Share cooperative learning model (TPS) is a cooperative learning model that gives students time to think and respond and help each other in pairs. In the Think Pair Share (TPS) type of cooperative learning model, there are three main stages, namely the Think stage, the Pair stage, and the Share stage.

At the Think stage (thinking individually), students are given an explanation of the material to be learned then given problems that must be done individually. In the Pair Stage (paired with a peer), students feel confused because, at the beginning of learning, students work individually and not in pairs. After being re-explained, the students become more understanding. Students are then given another problem to be solved in pairs. At the Share stage, the selected students alternately present the discussion results in front of the class, then at the end of the teacher's learning will help to infer the results of the problem discussed. Classes that use direct learning models, teachers dominate learning activities, examples of questions given and done by the teacher, the steps taught by the teacher are followed carefully by students and students imitate the workings and solutions done by the teacher without going through a thought process deeper and solving the resulting problem less creative.

Based on these explanations, it can be concluded that the use of Think Pair Share (TPS) type of cooperative learning model is no more effective than the direct learning model of mathematics learning interaction for Grade VII students of SMP Muhammadiyah 1 Yogyakarta in the second semester of 2016/2017 school year on the quadrilateral subject matter. This can occur because students are accustomed to using the direct learning model in the learning process and are not accustomed by the teacher to learn in groups.

CONCLUSION

1. There is no difference between students' mathematics learning interactions using Think Pair Share (TPS) type cooperative learning models and students' mathematics learning interactions using direct learning models in class VII students of SMP Muhammadiyah 1 Yogyakarta in semester II of the 2016/2017 school year. This is evidenced by the results of the first hypothesis test with a significance level of 5% and the degree of freedom 61 obtained value of $t_{count} = -0,7925$ and $t_{table} = 1,9996$ where $t_{count} = -0,7925 < t_{table} = 1,9996$ so that H_0 is accepted.
2. The Think Pair Share cooperative learning model is not more effective than the direct learning model for the interaction of mathematics learning for VII grade students of SMP Muhammadiyah 1 Yogyakarta in the second semester of the 2016/2017 school year. This is indicated by the results of the first hypothesis test, which proves that H_0 in the first hypothesis test is accepted. The second hypothesis test does not need to be continued, and conclusions can be drawn directly $t_{count} = -0,7925 < t_{table} = 2,6589$.

REFERENCES

- Direktorat Jendral Manajemen Pendidikan Dasar dan Menengah. 2010. *Pelaksanaan Penilaian dalam Implementasi KTSP Kementerian Pendidikan Nasional*. Jakarta: Direktorat Pembinaan
- Fathurrohman, Muhammad & Sulistyorini. 2012. *Belajar Pembelajaran: Meningkatkan Mutu Pembelajaran Sesuai Standar Nasional*. Yogyakarta: Teras
- Mulyasa, E. 2005. *Kurikulum Berbasis Kompetensi: Konsep, Karakteristik, dan Implementasi*. Bandung: Remaja Rosdakarya
- Sardiman, A. M. 2016. *Interaksi dan Motivasi Belajar-Mengajar*. Jakarta: Rajawali Pers.